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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,632	07/30/2003	Minoru Kikuchi	241063US2S	9120

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EXAMINER
KUHN, JORDAN M

ART UNIT	PAPER NUMBER
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/04/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/04/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	10/629,632	KIKUCHI, MINORU
	Examiner	Art Unit	
	Jordan Kuhn	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>30 July 2003</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-12</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-12</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>30 July 2003</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All   b) ☐ Some * c) ☐ None of:

    1. ☐ Certified copies of the priority documents have been received.

    2. ☐ Certified copies of the priority documents have been received in Application No. _____.

    3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>7/30/03</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

DETAILED ACTION

Specification

1.   The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claims 5 and 11 recite: the photographic frames are photographed with an imaging device installed on a movable body, and the velocity computing unit multiplies the object velocity by the distance between the imaging device and the object, thereby calculating a relative velocity between the imaging device and the object, however *the specification fails to disclose multiplying the object velocity by a distance in order to obtain the relative velocity.* The closest disclosure in the specification is at page 6 lines 7-17, and discloses where the running velocity of the object is calculated from the relative velocity of the object, the altitude of the airplane, and the flying velocity of the airplane. Claims 6 and 12 recite: the photographic frames are photographed with an imaging device fixed in position, and the velocity computing unit multiplies the object velocity by the distance between the imaging device and the object, thereby calculating a relative velocity between the imaging device and the object, however *the specification fails to disclose multiplying the object velocity by a distance in order to obtain the relative velocity.* The closest disclosure in the specification is at page 12 lines 10-19, and discloses determining the actual moving velocity of the object by multiplying the object velocity by the distance to the object.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3.   **Claims 3, 5, 6, 9, 11, and 12** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 3 and 9 recite varying at least one of N and M adaptively according to at least one of the object velocity, the size of the object area in the photographic field, and the frame rate of the photographic frames. The disclosure that this claim recitation relies upon is found at page 14 lines 19-26 in the specification. However, the disclosure does not enable one skilled in the art to make or use the invention. How are N and/or M varied adaptively based on object velocity, size of object area, or frame rate? Also, since N and M are both used in the calculation of the object area and the object velocity, and object area and/or object velocity is used in determining N and M, it is unclear how this occurs. Is the process iterative such that object velocity and object area are determined based on N and M and then N and M are modified based on the obtained object velocity and object area values? If this is the case, how are initial conditions determined?

Claims 5 and 11 recite: the photographic frames are photographed with an imaging device installed on a movable body, and the velocity computing unit multiplies the object velocity by the distance between the imaging device and the object, thereby calculating a relative

velocity between the imaging device and the object. However, the disclosure does not enable

one skilled in the art to make or use the invention. How is a relative velocity calculated by

multiplying the distance by the object velocity? (See objection to the specification, above)

Claims 6 and 12 recite: the photographic frames are photographed with an imaging

device fixed in position, and the velocity computing unit multiplies the object velocity by the

distance between the imaging device and the object, thereby calculating a relative velocity

between the imaging device and the object. However, the disclosure does not enable one skilled

in the art to make or use the invention. How is a relative velocity calculated by multiplying the

distance by the object velocity? (See objection to the specification, above)

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.   Claims 1, 4, 7, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Kato

(Japanese Pub No 05-284501, see attached machine translation).

Regarding **claim 1**, Kato discloses a method for monitoring an area comprising capturing

a plurality of successive frames of an object, extracting from a current frame the pixels

corresponding to the object, as disclosed at paragraphs 8-13, which reads on "an object area

extracting unit configured to extract, as an object area, a set of pixels from which an object has

been sensed over at least M (M<N) of N successive frames including the present frame", wherein

M=1, determining the center-of-gravity of the object, as disclosed at paragraph 15, which reads

on "a center-of-gravity computing unit configured to calculate the center-of-gravity position

coordinates of the extracted object area in the photographic field", comparing the center-of-

gravity of the object in the current frame to the center-of-gravity of the object in a previous

frame in order to determine the passing speed of the object, as disclosed at paragraph 15, which

reads on "a velocity computing unit configured to calculate the object velocity from the

movement of the calculated center-of-gravity position coordinates between different frames".

Regarding **claim 4**, Kato discloses everything as applied above (see claim 1). Kato

further discloses detecting the object in the current frame by binarizing the frame by using a

binarization threshold, as disclosed at paragraphs 8-13, which reads on "further comprising a

binarizing unit configured to binarize each pixel in the photographic frames on the basis of a

specified threshold value related to its luminance".

Regarding **claim 7**, it is interpreted and thus rejected for the same reasons as applied

above in the rejection of claim 1.

Regarding **claim 10**, it is interpreted and thus rejected for the same reasons as applied

above in the rejection of claim 4.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

7.   Claims 3, 5, 6, 9, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato.

Regarding **claim 3**, as best understood by the examiner, Kato discloses everything as applied above (see claim 1). However, Kato fails to specifically disclose varying at least one of N and M adaptively according to at least one of the object velocity, the size of the object area in the photographic field, and the frame rate of the photographic frames. However, the examiner takes Official Notice that it was extremely well known in the art to alter the frame rate of a video camera based on the application, and the examiner further maintains that it was extremely well known if not inherent that altering the frame rate results in changing N for any given time, and it therefore would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kato by providing for varying N according to the frame rate, for the purpose of accurately tracking movement and velocity of the object for all frames in the video.

Regarding **claim 5**, as best understood by the examiner, Kato discloses everything as applied above (see claim 1). Kato further discloses wherein the passing speed of the object is calculated based on not only the movement of the center-of-gravity of the object but also based on the movement of the camera, thereby computing a relative velocity, as disclosed at paragraph 15, but fails to specifically disclose where the actual velocity of an object is calculated by multiplying the relative velocity of the object by the distance to the object. However, the examiner takes OFFICIAL NOTICE that it was extremely well known in the art to provide for calculating the actual velocity of an object by multiplying the relative velocity of the object by the distance to the object, and it therefore would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kato by providing for calculating the actual velocity of

the object by multiplying the relative velocity of the object by the distance to the object, for the purpose of knowing and using the actual velocity of the object.

Regarding **claim 6**, as best understood by the examiner, Kato discloses everything as applied above (see claim 1). Kato further discloses wherein the passing speed of the object is calculated based on not only the movement of the center-of-gravity of the object but also based on the movement of the camera, thereby computing a relative velocity, as disclosed at paragraph 15, but fails to specifically disclose where the actual velocity of an object is calculated by multiplying the relative velocity of the object by the distance to the object. However, the examiner takes OFFICIAL NOTICE that it was extremely well known in the art to provide for calculating the actual velocity of an object by multiplying the relative velocity of the object by the distance to the object, and it therefore would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kato by providing for calculating the actual velocity of the object by multiplying the relative velocity of the object by the distance to the object, for the purpose of knowing and using the actual velocity of the object.

Regarding **claim 9**, it is interpreted and thus rejected for the same reasons as applied above in the rejection of claim 3

Regarding **claim 11**, it is interpreted and thus rejected for the same reasons as applied above in the rejection of claim 5.

Regarding **claim 12**, it is interpreted and thus rejected for the same reasons as applied above in the rejection of claim 6.

8.   Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato in view of Kondo (US Patent No 6,766,059).

Regarding **claim 2**, Kato discloses everything as applied above (see claim 1). However, Kato fails to specifically disclose where the object is separated into a plurality of segments and wherein the center-of-gravity of the object is determined by a weighted mean of the center-of-gravity of each segment. However the examiner maintains that it was well known in the art to provide for where an object is separated into a plurality of segments and wherein the center-of-gravity of the object is determined by a weighted mean of the center-of-gravity of each segment, as taught by Kondo.

In the same field of endeavor, Kondo discloses a method for extracting the foreground in a plurality of frames comprising dividing a foreground into a plurality of classes (k), calculating the number of pixels in each class, thereby getting the area, in pixels, of each class, finding the center-of-gravity for each class, and finding the center-of-gravity of the entire foreground by finding the weighted average of the center-of-gravity of the plurality of classes wherein the number of pixels in each class (area) is used as weights , as disclosed at column 16 line 40-57.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify Kato, by providing for where the object is separated into a plurality of segments and wherein the center-of-gravity of the object is determined by a weighted mean of the center-of-gravity of each segment, as taught by Kando, for the purpose of determining the center-of-gravity and then velocity of an object that has multiple segments.

Regarding **claim 8**, it is interpreted and thus rejected for the same reasons as applied above in the rejection of claim 2.

Conclusion

9.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Christian et al. (US Patent No 6,400,830) disclose a method for tracking objects through a series of images comprising determining velocity of an object by finding the center-of-gravity of the object in a plurality of frames and determining the distance between the centers of gravity over time. Kondo et al. (US Pub No 2004/0028287 and PCT Pub WO02/067200) disclose a method for object extraction comprising determining for each pixel, based on a plurality of frames, whether the pixel is a part of a foreground object or the background of the image. Badique (US Patent No 6,167,143) disclose a monitoring system comprising determining the center-of-gravity of an object and tracking the center-of-gravity across a plurality of frames. Kikuchi et al. ("Moving Target Detection from Infrared Images Using Genetic Algorithms") disclose a method for detecting a moving target object. Oka (Japan Pub No 2002190027) cited by applicant in the IDS dated 7/30/03, discloses a method for measuring velocity of an object comprising segmenting the object in a plurality of image frames and determining the velocity of the object based on the movement of the center-of-gravity of the object.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jordan Kuhn whose telephone number is 571-272-4295. The examiner can normally be reached on M-F 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

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like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jordan Kuhn
Examiner
Art Unit 2624

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